

DEVELOPING MODERN EDUCATION SYSTEMS FOR THE DELIVERY OF QUALITY LEARNING OUTCOMES

Alexandru Sereseanu

University of Applied Sciences and Arts Dortmund
European Master in Project Management
Emil-Figge-Str. 44, 44227, Dortmund, Germany
e-mail: alex.sereseanu@gmail.com

Abstract

As educators worldwide are facing increased competitive pressures caused by globalization and the opening of markets, many look for guidance in the concepts put forth by modern business theory and the practices of excellent organizations in the business sector. Excellence in business as in education can be achieved by mature, agile and self-improving organizations, but growing maturity requires patience, perseverance and commitment. Mature institutions realize that the key resources on which the modern education organization draws and builds lasting competitive advantages upon are people and their knowledge. The main challenge for them will be to embed this knowledge into the organization's systems and policies and to develop the capabilities to tune these in order to deliver excellent results in terms of learning outcomes.

This paper addresses teachers, course designers and all those interested in modern education based on knowledge management practices and commitment to quality. It encourages faculties and programmes to find meaningful ways of learning from business and apply modern management principles to institutions of education, introduce quantitative and qualitative measures of objectives and adapt to the principles and dynamics of knowledge markets.

In order to achieve and sustain lasting competitive advantages and excellence in education, institutions of learning cannot thus be contended with some minor tweaks or changes, they would need to reinvent themselves and the very way they think and act. They would also need strong leadership and a compelling vision to show the way, just as powerful as that produced by V.P. Kochikar over a decade ago: "...to be an organization where every action is fully enabled by the power of knowledge; which truly believes in leveraging knowledge for innovation; where every employee is empowered by the knowledge of every other employee; which is a globally respected knowledge leader."¹

Keywords

Knowledge Management Systems, Maturity, Learning Outcomes, Organizational Development

¹Kochikar, 2000, p. 4

1. Modern approaches to education

Just like countless enterprises worldwide, education institutions are increasingly being subjected to outside influences and forces. Globalization and competitive pressures on national labor markets and qualification systems can be felt by institutions from the primary to the tertiary education levels. In this context they have to acknowledge the existence of international knowledge markets and engage in competition for resources (such as competent teaching staff) and customers (applicants). Naturally, this phenomenon would not manifest itself in an uniform fashion, but be felt differently, as a result of national, regional and institutional features (such as the configuration of the national qualifications system: centrally planned, federal, etc. or the level of autonomy education institutions benefit from: academic freedom to research, teach and seek funding on the tertiary level vs. centrally planned curricula and teaching budgets on the primary level). For instance, there is a strong rivalry in the higher education sector in the Nordrhine-Westfalia region of Germany due to the high density of institutions, their relatively wide catchment area and competition for federal funding.

Facing competitive forces on international and domestic markets, business has learned to organize in a systematic way, to define value-adding processes, to set and measure the achievement of objectives. Excellent organizations have evolved to rely on knowledge embedded in people's minds as their fundamental resource and source of competitive advantages. In the education sector too, smart educators seeking more accountability and improvement in education “understand only too well that knowledge is their key asset-and many educational institutions are seeking better ways to transform that knowledge into effective decision-making and action.”² Since institutions of education primarily deal in knowledge, the application of modern knowledge management practices should not strike as a particularly novel idea but rather as “a new spin on their *raison d’être*”³.

Organizational knowledge management (KM) development should be seen as a cyclical process that can be mastered and improved in time. As institutions of education develop capabilities to handle knowledge, their ability to deliver results increases, leading to higher stages of overall organizational maturity and lasting competitive advantages. The process is composed of several steps listed below and presented in more detail in the chapters to follow :

1. Stakeholders should be identified, their interests explored and incorporated into the organizational objective system. Institutions of education should especially be interested in what qualifications are required by the labor market and what competitive positions they can fill in the education market.
2. Organizational systems and processes should be defined with these objectives and priorities in mind. In this stage, the learning outcomes management system should be designed to deliver appropriate results for the set of objectives identified before.
3. Then, the organizational knowledge management system should be set up to enable the proper delivery of qualifications and measurement of their achievement as generic goals and practices turn into specific action areas in order to achieve set overall organizational objectives.
4. Finally, achievements in terms of learning outcomes and other organizational results (competitive position, professional standards compliance, provision of qualified employees in support of domestic and international business) should be measured against set objectives periodically and corrective actions be taken to close eventual gaps.

²Petrides, 2003, p. 6

³Kidwell, 2001, p. 33

2. Stakeholder involvement

Prior to setting new objectives and redefining organizational systems, a comprehensive stakeholder analysis should be performed. Due to the public nature of educational activities, organizations acting in this field have many stakeholder groups settled on all levels of society, from the international to the local and institutional level. Their interests shape the objective system of education organizations as they reflect the needs and requirements of society, policy makers and business communities. When thinking of developing outcomes based education systems, faculty chairs and programme developers should consider the requirements of stakeholders on all decision levels mirrored in national education policy, professional standards, business surveys, etc. Stakeholder expectations management might include:

- managing LO processes and individual qualifications at institution/programme level
- promoting employability by imparting desired qualifications to support local businesses
- supporting regional/national employment/development priorities and action plans

The figure and associated table below represent a double perspective on the institution of education situated at the intersection of multiple groups of interest and their expectations: as a learning outcomes management system (LOMS) influenced by education and training policy (expressed in professional standards and various qualifications frameworks) and as a knowledge creating enterprise competing in the education market looking to satisfy the interests of its clients and business partners. This approach based on twin perspectives (KMS-LOMS) will be followed throughout the paper.

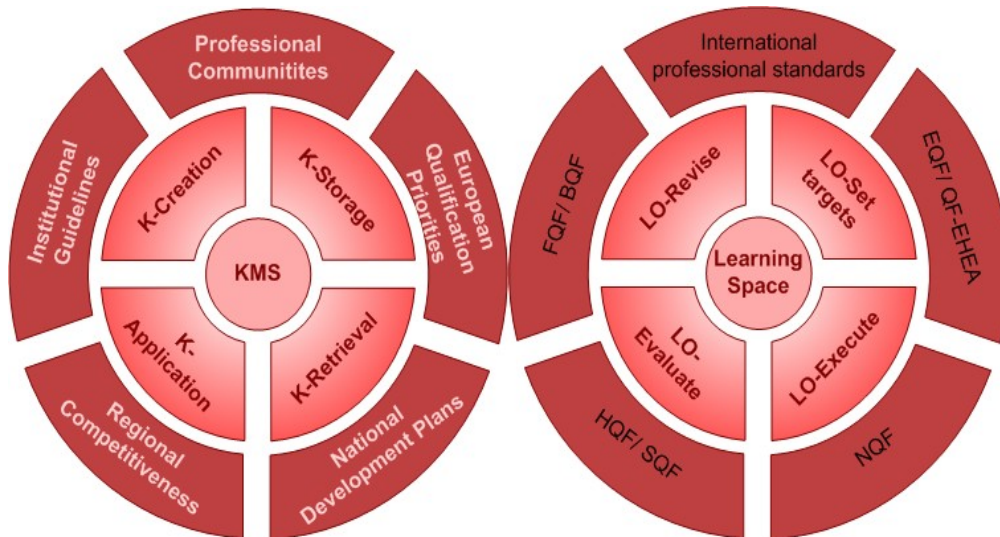


Figure 1: Different perspectives and stakeholder interests in education⁴

Level	Stakeholder Interests	Qualifications Frameworks
International	Professional communities setting international standards of practice.	International professional standards (IPMA ICB, PMI PCM)
European	European qualifications requirements expressed in policy papers.	European Qualifications Frameworks (both QF-EHEA and QF-LLL)
National	National education objectives expressed in national development plans.	National Qualifications Frameworks (NQF)
Regional and Local	Local developments priorities in support of domestic business.	Higher Education QF (HQF) and Sectoral QF (SQF)
Institutional	Internal guidelines and objectives for entire organizations or separate business units.	Faculty QF (FQF) and Business Organization QF (BQF)

⁴own representation with elements from Gehmlich, 2008, p. 11 and Bloom, 2007, p.6

3. Learning outcomes and organizational results management

Traditionally, the teacher/student interaction occurs in the learning space provided by the institution of education or programme. Biggs envisions the learning space as a system which integrates classroom, departmental and institutional levels and where all aspects of teaching and assessment are tuned to support high-level learning. In this context he talks about constructive alignment as an approach to curriculum design that optimizes the conditions for quality learning. It gives the student an active role in the education process by assuming that meaning is not being absorbed passively from the teacher any more but rather constructed autonomously. The teacher would facilitate the process by setting up a learning environment that supports the learning activities appropriate to achieving the desired LO:

- „In setting up an aligned system, we specify the desired outcomes of our teaching, in terms not only of topic content, but in the level of understanding we want students to achieve.
- We then set up an environment that maximizes the likelihood that students will engage in the activities designed to achieve the intended outcomes.
- Finally, we choose assessment tasks that will tell us how well individual students have attained these outcomes, in terms of graded levels of acceptability. These levels are the grades we award.

There are thus four major steps:

1. Defining the desired learning outcomes (DLOs)
2. Choosing teaching/learning activities likely to lead to the DLOs
3. Assessing students' actual learning outcomes to see how well they match what was intended
4. Arriving at a final grade⁵

Gehmlich introduces the concept of 'learning chain' to signal the shift of paradigm from a 'teacher-centered' to a 'student-centered' system of learning. The 'student-centered' or outcomes-based approach places “the learner in the center of programme design, indicating the promise between those who offer the learning programme and those who register.”⁶ When teachers define what a learner should do instead of writing course contents, they promise a value added in terms of learning outcomes to all those who register and qualify to attend a particular unit of learning. This promise has then following elements:

1. “The learning outcomes, i.e. a learner can achieve those learning outcomes designed for the respective learning activity, taking into account that the learning outcomes are statements of what a learner is expected to know, understand, and/or be able to do at the end of a period of learning.”⁷
2. The learner has to invest time and effort – his or her workload. The workload is a quantitative measure of all learning activities that may be feasibly required for the achievement of the learning outcomes.⁸

The workload is expressed as a quantitative figure, the credit. The achievement is expressed as a qualitative result, the learning outcomes.”⁹

By registering for a programme, a learning agreement is closed between learners on the one hand, who agree to be assessed and tested in order to be eligible for the desired degree, while on the other hand, the institution agrees to make available the teaching and learning facilities to ensure that the learning outcomes can be achieved in the stipulated time and to award a degree, certificate as soon as the learner has fulfilled the learning requirements.

⁵Biggs, 2003, p. 1-2

⁶Gehmlich, 2008, p. 7

⁷EQF, 2008, p. 4

⁸ECTS, 2009, p. 16

⁹Gehmlich, 2008, p. 7

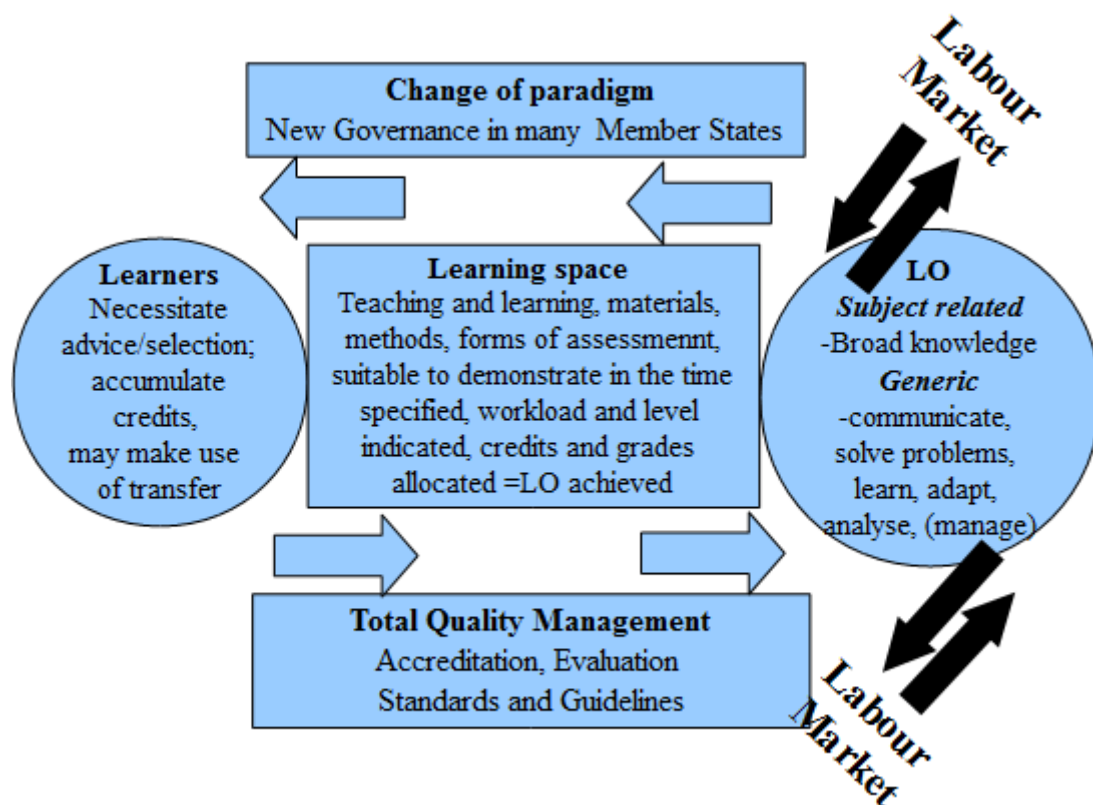


Figure 2: The learning chain. A promise¹⁰

With the basic concepts of 'learning space' and 'learning chain' at hand, and a link with stakeholders and markets in place, the next lesson that should be learned from business is to regard the implementation of learning outcomes as a key organizational process. Eduventures, one of the leading providers of technical solutions for the management of outcomes defines learning outcomes management (LOM) as “solutions that help colleges and universities develop, deliver, report, and manage assessment-related items and activities. [...] Specifically, the process of LOM focuses on setting target goals, acting to achieve those goals, evaluating the outcome, and making improvements before setting new goals and starting the process over .”¹¹ According to the Eduventures philosophy, effective LOM spans across three organizational levels with different activities serving the information needs of key institutional stakeholders (students, faculty, administrators):¹²

- Student/course level: student outcome tracking, course evaluation, course support services
- Program level: program assessment, benchmark tracking, curriculum planning
- Institutional level: institutional research, institutional accreditation

The key organizational challenge at this stage of system development would be to select appropriate objectives for student outcomes tracking. Institutions have to choose a mix of longitudinal goals (targets that measure improvement from students' matriculation to graduation) and benchmark-driven goals (targets that measure student performance against previously established criteria). Additionally, other priorities and goals researched during the stakeholder analysis should also be integrated here as part of the organization's objectives system and appropriate success metrics be found.

¹⁰Gehmlich, 2008, p. 7, © gehmlich@wi.fh-osnabrueck.de

¹¹Bloom, 2007, p. 6

¹²Bloom, 2007, p. 7

4. Organizational KM Architecture

In order to find an institution-wide approach for the management of learning-outcomes it might be helpful to adopt another perspective of organizational processes as well. Regarding organizations as knowledge management systems might enable them to develop a coherent and harmonic framework for the delivery of outcomes. KM literature of the day generally recognizes that the architecture of a KM System (KMS) should address four broad areas: Content, Technology, Processes and People.

Content

In the institutional context Kulkarni and Freeze distinguish four broad areas that represent knowledge in most organizations: Expertise, Lessons Learned, Knowledge Documents, and Data. This categorization resulted from the realization that knowledge in each area has a unique 1) mix of tacit and explicit content, 2) method of transfer and contextual value, and 3) life cycle (creation to application) including shelf life.¹³

- **Expertise** is knowledge that may be gained through experience or formal education.
- **Lessons learned** are successes and failures from similar past projects and are sometimes referred to as best-known-methods.
- **Knowledge documents** are explicit knowledge codified for future use.
- **Data** includes the facts or figures obtained originally from operations and stored in databases and dimensional data warehouses.

KM Enablers: Processes, IT Infrastructure, People

Alavi and Leidner identify four sets of socially enacted knowledge processes in organizations as knowledge systems: (1) creation/construction, (2) storage/archival, (3) retrieval/transfer, and (4) application/reuse. “This view of organizations represents both the cognitive and social nature of organizational knowledge and its embodiment in the individuals cognition and practices as well as the collective practices and culture. The knowledge processes do not represent a monolithic, but an interconnected and intertwined set of value adding activities.”¹⁴

1. **Knowledge Creation** – developing new content or replacing existing content within the organizations tacit and explicit knowledge.
2. **Knowledge Storage** – organizing storing and retrieving the organizations tacit and explicit knowledge categories.
3. **Knowledge Retrieval** – managing knowledge transfers on all organizational levels.
4. **Knowledge Application** – using mechanisms of knowledge integration to embed new insights into the organization's knowledge base.

IT infrastructure is a powerful organizational enabler of KM practices as it can create an environment to facilitate organizational knowledge management by actualizing, supporting, augmenting, and reinforcing knowledge processes through enhancing their underlying dynamics, scope, timing, and overall synergy. IT has many applications, on all levels of the organization.

Organizational behavior also plays a significant role in leveraging organizational knowledge, even more than IT. At the center of any KMS are the people and their tightly knit framework of relationships and social interactions. The success of KM initiatives depends highly upon being widely perceived, accepted and used within groups situated on all organizational levels.

The following figure represents the basic building blocks of a KMS designed for institutions from the field of education, containing the architectural elements described above and corresponding concepts to those presented in the chapter before.

¹³Kulkarni, 2004, p.658-659

¹⁴Alavi, 2001, p. 115-116

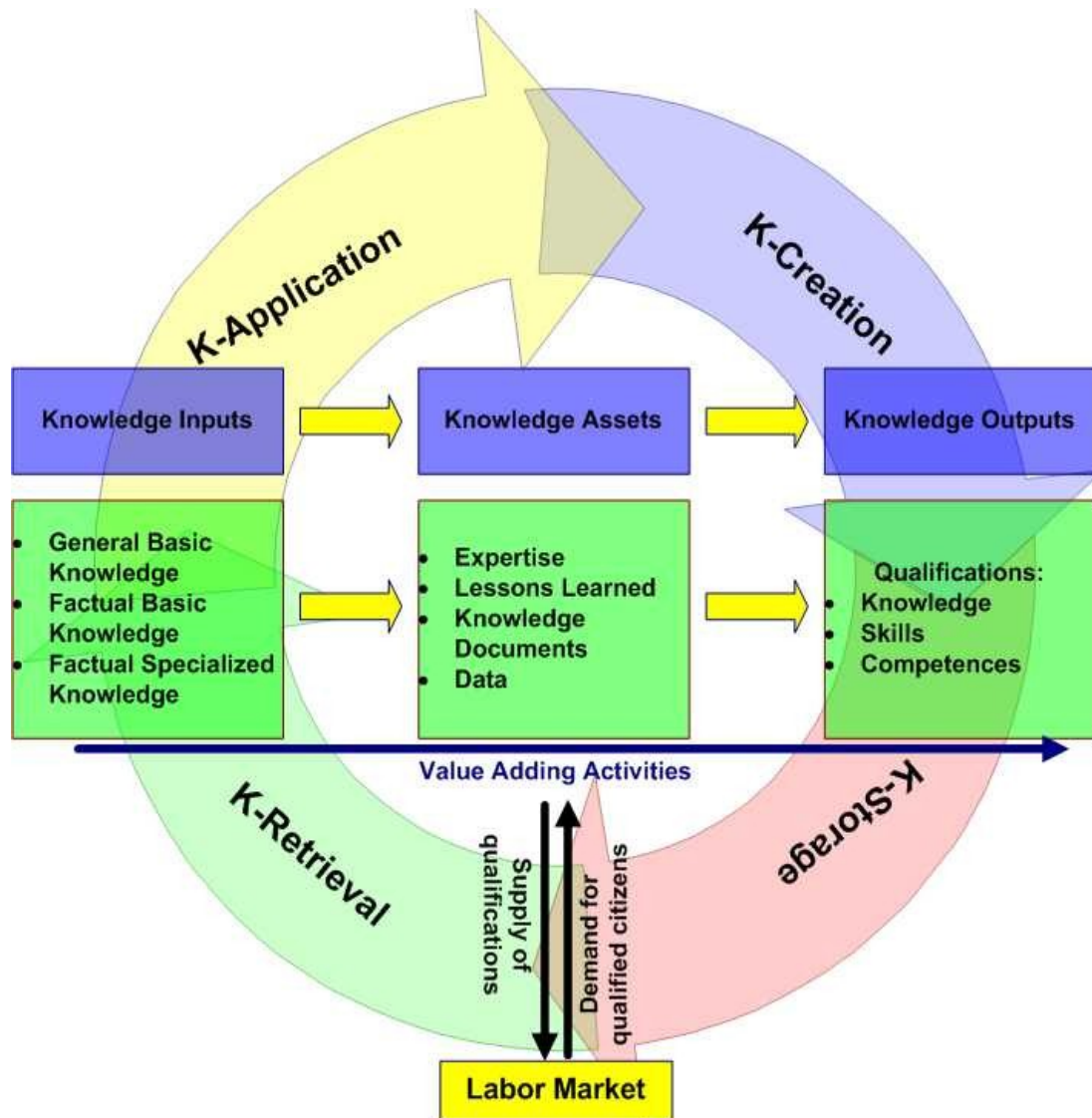


Figure 3: Institutions of education as Knowledge Management Systems

This type of institution responds to societies demands for qualified citizens by supplying educational services based on learning outcomes. From a knowledge perspective they are situated in a continuously changing environment as knowledge categories are expanded every day.

Knowledge inputs come from these fields to replenish the wealth contained within institutions of education where they are incubated and eventually shared.

The organization internalizes and transforms this knowledge as it is embedded in it's processes and systems. At this level, knowledge categories are being managed as assets as they are being added to the wealth of knowledge already possessed.

These knowledge categories are being managed in order to deliver organizational results, which are measured at the output level in form of learning outcomes or individual qualifications. From the institutional point of view these represent the main areas of performance delivery and measurement.

This model acknowledges that organizations do not stand isolated from the the world, symbolized here by the built-in direct two-way relationship with the labor market. By acknowledging requirements, objectives, national/regional/local education priorities and by incorporating these into the organizational objective system this link is kept alive and serves as a valuable external reference point for the institution of learning.

5. Integrating and tuning system components

The stakeholder analysis performed at the beginning of the development cycle would have produced a catalog of learning outcomes and associated assessment criteria to be incorporated into course unit descriptions and a set of generic goals and practices the organization would have to rely upon in order to enable the achievement of these outcomes by students. By acquiring the necessary organizational knowledge and by adapting organizational behavior and infrastructure in order to guarantee appropriate facilities, teacher-learner activities and assessment tasks for the promised outcomes, the institution builds up capabilities to handle knowledge, unlocking higher levels of maturity and enabling higher order generic goals and practices. The figure below represents an abstract view of this system and its components.

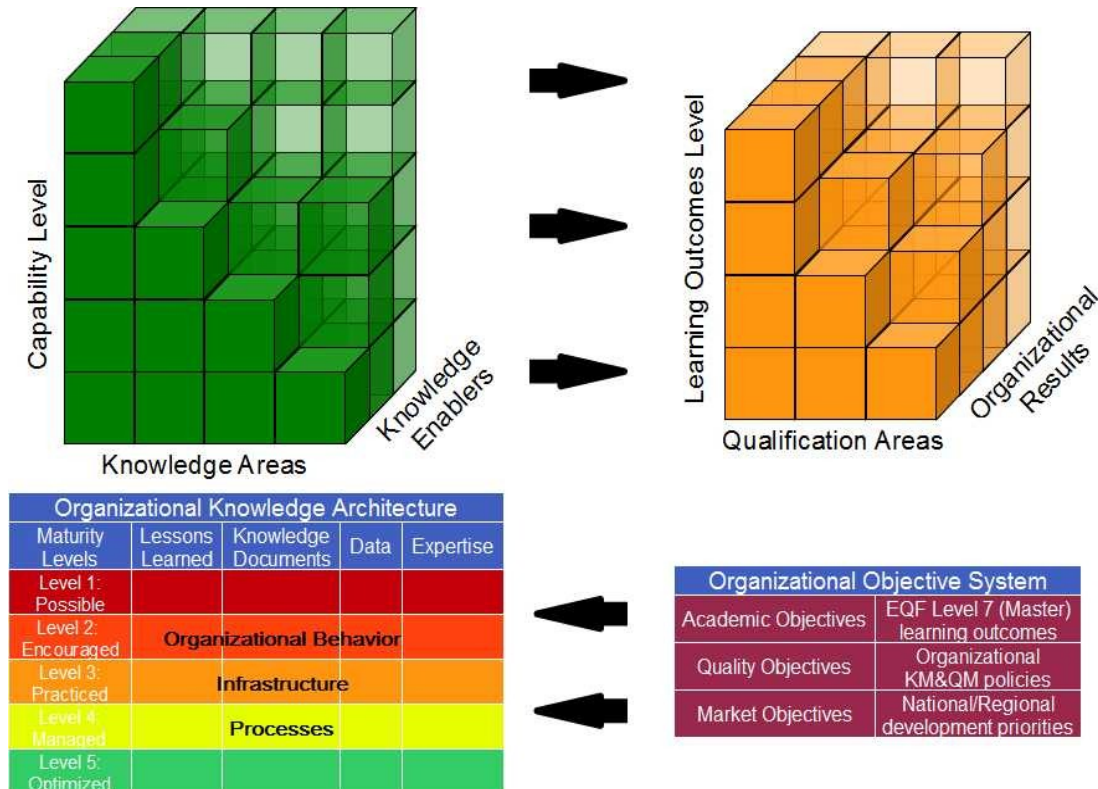


Figure 4: A framework proposal for organizational development

The figure emulates the double perspectives (Enablers-Results) of the EFQM Excellence Model's approach¹⁵. On the right side, organizational results are being produced and measured in the form of achieved learning outcomes and other results grouped in several key results areas as presented above. This is the LOM system with its associated process, staff and infrastructure. The left side of the model is organized around knowledge in its organizational context with associated KM process, knowledge workers and supporting IT infrastructure. On the one hand, the KM system enables results to be produced as indicated by the set of arrows pointed to the right, but on the other organizational objectives and associated metrics are fed back into the system for corrections and quality improvement through a loop as indicated by the arrows pointing to the left. By this device a cycle of organizational development is created, as explained at the beginning of this work: the stakeholder analysis, periodically performed, reveals goals and requirements to be incorporated into the organization's objective system which should be first reflected in the proposed outputs, then fed into the organizational KM system as goals and practices to be achieved. Finally, periodic review of delivered results would reveal the measure of results achievement and enable the organization to take corrective actions in order to close eventual gaps.

¹⁵EFQM, 2010, p. 9

6. Review and improvements

The final step to close the organizational development cycle is to review the achieved results and compare them to the targets set at the beginning of the cycle. But first, the form and timing for the review process need to be carefully chosen since traditional review is generally initiated by external parties and only limited useful for organizational development: programme accreditation is a mandatory periodic process initiated by external agencies and serves the purpose to certify education quality according to set standards while institutional surveys are usually taken at the end of every education cycle at the initiative of the board of administrators and serve the purpose to measure overall customer satisfaction with the education services. It might be useful on these occasions for programme developers to conduct some form of internal audit with the purpose of assessing and improving the organizational effectiveness to design and deliver learning outcomes and to develop mature organizational processes in support.

In terms of learning outcomes, the review would check whether

- the organization delivers qualifications consistent with proposed qualifications levels,
- imparted qualifications have a favorable mix of generic and specific competences,
- graduates have sufficient education and training to be employable in the labor market,
- outcomes are consistent with institutional policy and national education objectives.

In terms of knowledge processes and supporting infrastructure, the review process would find answers to questions such as:

- does the organization have the necessary knowledge to achieve proposed outcomes?
- is there a knowledge sharing culture in place supported by appropriate IT infrastructure and mature processes capable of delivering this knowledge to enrolled students?
- are there clear policies for the management of knowledge and of quality in place?

During their implementation of a KM maturity project at Siemens, Langen and Ehms have developed a review procedure in six steps that can be used to analyze any type of organization:¹⁶

1. **Orientation and Planning** – Stakeholder expectations related to the KM maturity process are being explored and key stakeholders identified.
2. **Motivation and Data Collection** – Through active communication and leadership initiatives stakeholders are being motivated. Relevant analysis data is being collected in structured interviews and workshops.
3. **Consolidation and Preparation** – In this phase the acquired data is being consolidated, maturity levels mapped out and the results are being prepared for presentations.
4. **Feedback and Consensus** – Results are openly discussed and consensus between the organizations members and the assessment team is reached.
5. **Ideas for Solutions and Proposals** – Actual improvement steps are not intended in the review but suggestions for improvement can be drawn from each assessment.
6. **Report & Presentation** – Final report, lessons learned and future steps.

Following the internal review process, the organization would proceed with improving its capabilities in weak or critical knowledge areas that have been revealed. Process maturity is gained gradually, as the organization gets better at managing its knowledge but it can also be raised by device of targeted KM initiatives. Formal KM initiatives could be resulting from external factors such as a regulative requirements or competitive pressures from the markets but also, from another business unit or from another decision area. At any rate, there is a certain clarity of purpose and scope required when planning, initiating and implementing such a project in education institutions since KM initiatives could be either massive in size, affecting the entire organization or be restricted to a particular department or programme. Some of the authors with implementation experience in business enterprises actually recommend that organizational development models and KM initiatives be first tried out in pilot projects to prove their feasibility before raising support for implementation in other organizational areas.

¹⁶Ehms. 2002, p. 6-7

7. Conclusions

This paper attempts to show how scaling organizational capabilities to manage knowledge is achievable by redefining organizational roles and systems to support a knowledge sharing culture, by gradually learning to master knowledge using learned lessons and past mistakes, and by systematic implementation of knowledge management initiatives targeted across key knowledge areas. This would require that teaching and supporting staff create and work in a collaborative environment following well defined policies and practices of management with clear procedures of capturing and using lessons learned.

It also shows that embracing the principles and workings of knowledge markets means relating to international, European, national and regional standards and practices of education such as the modern paradigm of life-long learning based on outcomes. This requires modern institutions to make the transition to an aligned education system with a defined value added in terms of learning outcomes, and associated teaching-learning activities supported by appropriate staff, processes and infrastructure.

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